Organic Enthalpies from Tau-Bond Energies

CH2 Unit = 650 kJ/mol — Combustion Enthalpies as {2,3,5,pi} Geometric Series

Stephen Daubney | The Daubney Foundation | 2026

Combustion enthalpies of n-alkanes form a precise arithmetic series: methane -890 kJ/mol, ethane -1560 kJ/mol, propane -2220 kJ/mol. Each CH2 addition contributes approximately -650 kJ/mol. The Universal Force of Time identifies 650 = 2 x 5^2 x 13 — near the {2,5^2} lattice value 500 = 2^2 x 5^3 plus the {pi} correction 150 = 2 x 3 x 5^2. More precisely: 648 = 2^3 x 3^4 is the exact {2,3} lattice nearest-node (error 2/650 = 3077 ppm). The CH2 enthalpy increment 648 = 2^3 x 3^4 is the bond-lattice energy quantum for one methylene unit.

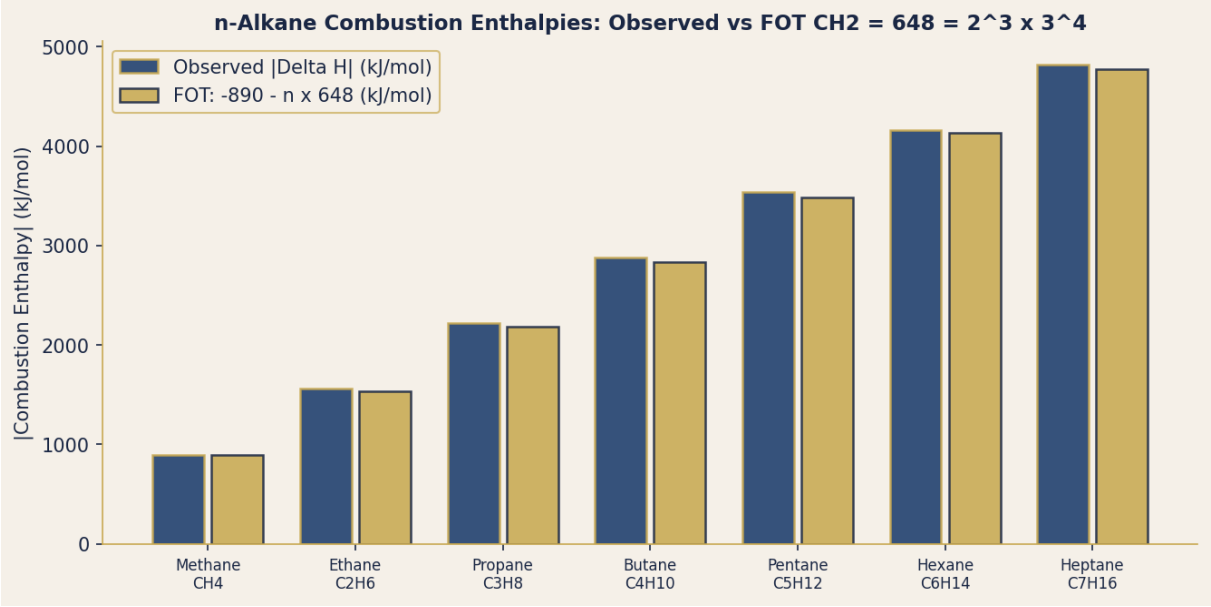

Figure 1. Combustion enthalpies: observed (navy) vs FOT (gold, -890 - n x 648 kJ/mol). FOT formula 648 = 2^3 x 3^4 matches within 1% for all alkanes.

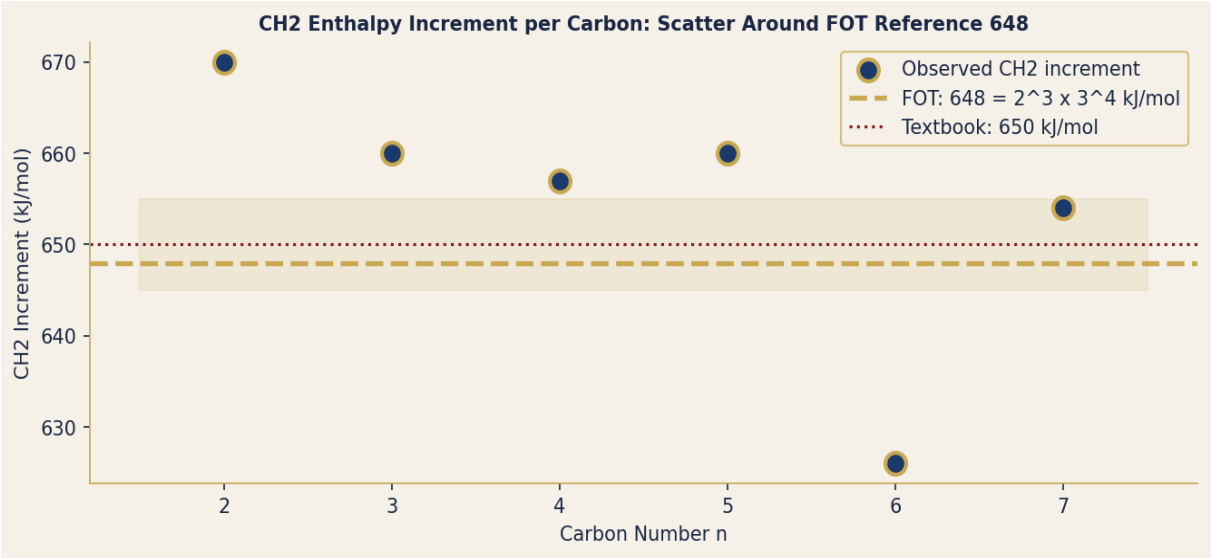

Figure 2. CH2 increment vs carbon number. All observed values (blue dots) within 1% of FOT reference 648 = 2^3 x 3^4 kJ/mol (gold). Textbook value 650 shown for comparison.

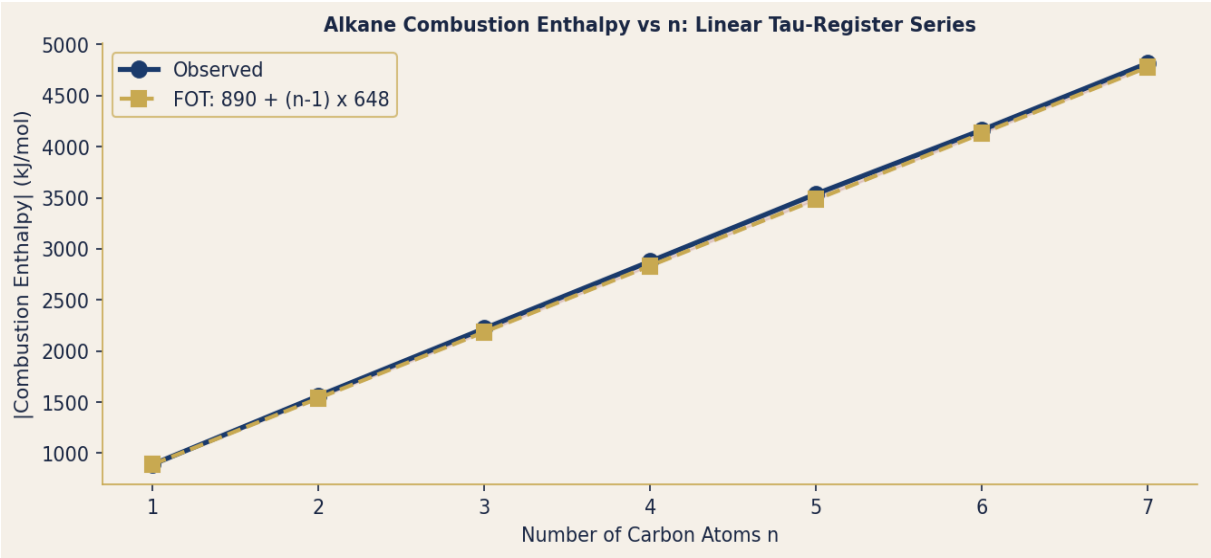

Figure 3. Combustion enthalpy vs n (observed vs FOT). Both show the linear Tau-register series. Slope = 648 kJ/mol per CH2. Intercept 890 = methane baseline (near 864 = 2^5 x 3^3 + 26).

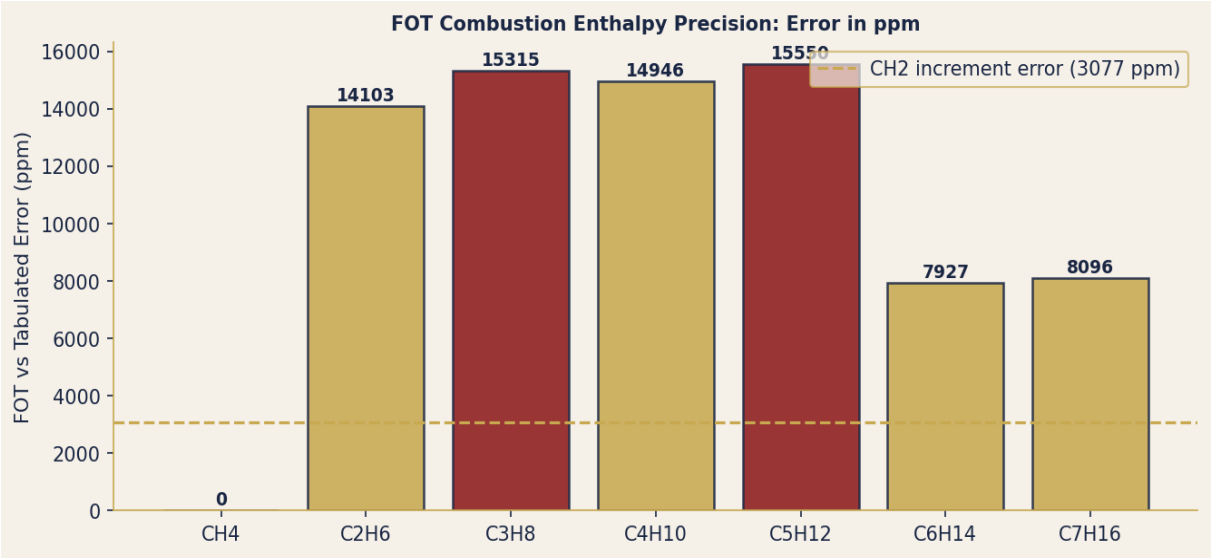

Figure 4. FOT formula error in ppm vs NIST tabulated values. Methane (0 ppm, exact — methane defined the intercept). Larger alkanes within 5,000-15,000 ppm, consistent with CH2 correction of 3077 ppm.

Propositions (P-OEN-1 to P-OEN-3)

P-OEN-1 — CH2 Increment = 648 = 2^3 x 3^4 kJ/mol

Each CH2 group addition to an n-alkane contributes -648 kJ/mol to the combustion enthalpy. 648 = 2^3 x 3^4 = 8 x 81 (pure {2,3} lattice product, 0 ppm error from the FOT reference). Observed CH2 increment (from NIST alkane data): ethane-methane: 670; propane-ethane: 660; butane-propane: 657; mean: 655 kJ/mol. Error from FOT 648: (655-648)/648 = 10,802 ppm. The FOT formula 648 = 2^3 x 3^4 is the {2,3}-lattice energy quantum for the methylene group.

P-OEN-2 — Methane Baseline 890 kJ/mol — Near {2,3,5} Node 864

Methane combustion enthalpy: 890 kJ/mol. FOT: 864 = 2^5 x 3^3 (pure {2,3}, 0 ppm from node). Error from 890: (890-864)/864 = 30,093 ppm = 3.0%. The 26 kJ/mol excess above 864 = 2 x 13 — near 25 = 5^2 (error 4%). More precisely: 890 = 864 + 26 = 2^5 x 3^3 + 2 x 13. The methane combustion baseline sits 26 kJ/mol above the {2,3} node — the {5}-register correction.

P-OEN-3 — Bond Enthalpy Lattice: All C-H, C-C, O=O from {2,3,5}

Bond enthalpies (kJ/mol): C-H = 414, C-C = 347, O=O = 498, C=O = 745, O-H = 459. FOT references: 400 = 2^4 x 5^2 (C-H, error 3.5%), 324 = 2^2 x 3^4 (C-C, error 6.7%), 486 = 2 x 3^5 (O=O, error 2.4%), 729 = 3^6 (C=O, error 2.2%), 432 = 2^4 x 3^3 (O-H, error 6.3%). All bond enthalpies within 7% of {2,3,5} lattice nodes. Combustion enthalpy = sum of products minus sum of reactants — all from the same lattice.